CLAIMS

1. A method of irradiating, with an optimal amount of cumulative irradiation, an article having first and second opposite sides, including the steps of:

directing a radiation beam to the first side of the articles for the passage of the radiation beam through the article,

rotating the article through an angle of substantially 180° to have the second side of the article face the radiation beam,

thereafter directing the radiation beam to the second side of the article for the passage of the energy beam through the article, and

disposing a member in the path of the electron beam with a thickness, dependent upon the thickness of the article, to provide a the article with the optimal amount of the cumulative irradiation.

2. A method as set forth in claims 1 wherein

the member is disposed in the path of the radiation beam to the article only when the thickness of the article is between particular limits.

3. A method as set forth in claim 2 wherein

the member is provided with a thickness dependent upon the thickness of the article at different positions between the particular limits.

4. A method as set forth in claim 1 wherein

the direction of the radiation beam toward the article provides for an irradiation of the article with the optimal amount of cumulative irradiation for thicknesses of the article to a first value, provides for an irradiation of the article with an amount of cumulative radiation greater than the optimal amount of cumulative radiation for different thicknesses of the article between a first value and a second value greater than the first value and provides for a cumulative irradiation of the article with the optimal amount of cumulative irradiation for thicknesses of the article between the second value and a third value greater than the second value and wherein

the member is disposed in the path of the radiation beam, when the thickness of the article is between the first value and the second value, to provide the article with a cumulative amount of irradiation at the optimal value.

5. A method as set forth in claims 4 wherein

the member is provided with a thickness, when the thickness of the article is between the first and second values, to provide the article and the member with a combined thickness between the second and third values.

6. A method as set forth in claim 1 wherein

the member is provided with a cumulative amount of irradiation, when the thickness of the article is between the first value and the second value, to reduce the cumulative amount of the irradiation in the article to the optimal value.

7. A method of irradiating, with an optimal amount of radiation,

an article having first and second opposite sides, including the steps of:

providing a radiation beam for irradiating the article,

disposing the article in the path of the radiation beam,

providing a member with different thicknesses at different positions on the member,

providing for the disposition, between the energy beam and the article, of a portion of the member with a particular thickness dependent upon the thickness of the article,

directing the radiation beam through the member to the first side of the article,

rotating the article relative to the radiation beam through an angle of substantially 180° to have the second side of the article face the radiation beam after the radiation beam has been directed through the member to the first side of the article,

thereafter directing the radiation beam through the member to the second side of the article.

8. A method as set forth in claim 7 wherein

the cumulative irradiation received by the article with the first and second sides of the article facing the radiation beam exceeds the optimal amount of irradiation in a particular range of thicknesses of the article and wherein

the member is positioned between the radiation beam and the article in the particular range of thicknesses of the article to reduce the cumulative amount of the irradiation at the article to the optimal amount.

9. A method as set forth in claim 8 wherein

the excess of the radiation above the optimal amount is different for different thicknesses of the article in the particular range and wherein

the amount of reduction of the cumulative irradiation in the article is varied in accordance with the thickness of the article in the particular range.

10. A method as set forth in claim 7 wherein

the member is disposed between the radiation beam and the article only when the thickness of the article is within a particular range of values.

11. A method as set forth in claim 7 wherein

the member is disposed between the radiation beam and the article only when the thickness of the article is between a first value and a second value and each of the first and second values is greater than zero and the second value is greater than the first value.

12. A method as set forth in claim 10 wherein

the member is positioned between the radiation beam and the article to provide to the radiation beam a thickness dependent upon the thickness of the article between the first value and the second value.

13. A method as set forth in claim 7 wherein

the optimal amount of the cumulative irradiation is in a particular range of thicknesses of the article greater than the second value and wherein the member is not disposed between the radiation beam and the article when the article has a thickness in the particular range.

14. A method as set forth in claim 7 wherein

the optimal amount of the cumulative radiation is in a range of thicknesses of the article less than the first value and wherein the member is not disposed between the radiation beam and the article when the article has a thickness less than the first value.

15. A method as set forth in claim 7 wherein

the member is provided with a variable thickness at different positions on the member and wherein

the member is positioned relative to the radiation beam to provide to the radiation beam a thickness dependent upon the thickness of the article between the first value and the second value.

16. A method of irradiating, with an optimal amount of cumulative irradiation, an article having first and second opposite sides, including the steps of:

directing radiation to the opposite sides of the article, and

disposing a member, in the path of the radiation beam to the article, to reduce the cumulative amount of the irradiation in the article to the optimal amount of the cumulative irradiation, when the cumulative irradiation in the article would otherwise exceed the optimal amount of the cumulative irradiation.

17. A method as set forth in claim 16 wherein

the member is disposed in the path of the radiation beam to the article only when the thickness of the article is between first and second limits.

18. A method as set forth in claim 17 wherein

each of the first and second limits is greater than zero (0).

19. A method as set forth in claim 18 wherein

the member is provided with a thickness dependent upon the thickness of the article at different positions between the first and second limits.

20. A method as set forth in claim 17 wherein

the excess of the irradiation above the particular amount is different for different thicknesses of the article between the first and second limits and wherein

the amount of reduction of the cumulative irradiation in the article is varied in accordance with the thickness of the article between the first and second limits.

21. A method as set forth in claim 16 wherein

the optimal value of the cumulative amount of the irradiation is provided in the article in a range of thicknesses of the article less than the first limit and wherein

the member is not disposed between the radiation beam and the article when the article has a thickness less than the first limit.

22. A method as set forth in claim 16 wherein

the member is provided with an individual thickness at different positions on the member and wherein

the member is positioned relative to the radiation beam to provide to the radiation beam a thickness dependent upon the thickness of the article between the first and second limits.

23. A method as set forth in claim 16 wherein\

the direction of the radiation beam toward the article provides for an irradiation in the article with the optimal amount of the cumulative irradiation for thicknesses of the article less than the first limit, provides for an irradiation of the article with an amount of cumulative irradiation greater than the optimal amount of the cumulative irradiation for different thicknesses of the article between the first and second limits and provides for a cumulative irradiation of the article with the optimal amount of the cumulative irradiation for thicknesses of the article between the second limit and a third limit greater than the second limit and wherein

the member is disposed in the path of the radiation beam, when the thickness of the article is between the first and second limits, to provide the article with the optimal amount of the cumulative irradiation.

24. A system for irradiating, with an optimal amount of cumulative radiation, an article having first and second opposite sides, including

apparatus for providing radiation,

a loading area,

an unloading area,

a conveyor for transporting the article from the loading area past the radiation apparatus to the unloading area for an irradiation of the first and second sides of the article by the radiation apparatus,

the article being constructed to receive the optimal amount of the cumulative irradiation for first thicknesses of the article and to receive greater than the optimal amount of the cumulative irradiation for second thicknesses of the article, and

a member having first and second positions and disposed in the first position for the first thicknesses of the article to provide for the irradiation of the article by the radiation apparatus without any passage of the radiation through the member and disposed in the second position to provide, for the second thicknesses of the article, for the irradiation of the article by the radiation apparatus after the passage of the irradiation through the member to reduce the cumulative amount of the irradiation in the article to the optimal value.

25. A system as set forth in claim 24, including,

apparatus for positioning the member to the first position for the first thicknesses of the article and to the second position for the second thicknesses of the article.

26. A system as set forth in claim 24, including,

the member being provided with a thickness in the second position to reduce the cumulative irradiation in the article from an amount above the optimal value to the optimal value.

27. A system as set forth in claim 24 wherein

the article is constructed to provide individual amounts of irradiation greater than the optimal value for individual positions in the second thicknesses of the article and wherein

the member is constructed to receive individual amounts of the cumulative irradiation at individual ones of the second positions of the member to reduce the cumulative radiations in the individual positions in the second thicknesses of the article to the optimal value.

28. A system as set forth in claim 24 wherein

the article is constructed to receive individual amounts of cumulative irradiation greater than the optimal value in individual positions in the second thicknesses of the article when the

member is not disposed in the path of the radiation from the radiation apparatus to the article and wherein

the member is constructed to receive individual amounts of irradiation at individual thicknesses in the second positions of the member and is disposed relative to the radiation apparatus and the article in the individual positions in the second thicknesses of the article to reduce the cumulative irradiation in the second thicknesses of the article to the optimal amount.

29. A system as set forth in claim 28 wherein

apparatus is provided for the member to position the member to the first position for the first thicknesses of the article and to individual ones of the second positions for individual ones of the second thicknesses of the article to reduce the cumulative irradiation in the second thicknesses of the article to the optimal amount.

30. A system for irradiating, with an optimal amount of cumulative irradiation, an article having first and second opposite sides, including

a source of radiation,

a loading area,

an unloading area,

a conveyor for transporting the article from the loading area past the radiation source to the unloading area for an irradiation of the first side of the article by the radiation source,

a mechanism for rotating the article through an angle of 180° after the irradiation of the first side of the article by the radiation source and for introducing the rotated article to the conveyor for the transport of the article past the radiation source and for the irradiation of the second side of the article by the radiation source,

the article being of a size to receive a cumulative amount of radiation greater than the optimal value, and

a member positionable between the radiation source and the conveyor for reducing to the optimal level the cumulative amount of irradiation introduced to the first and second sides of the article when the article has a size to receive a cumulative amount of irradiation greater than the optimal amount.

31. A system as set forth in claim 30 wherein

the article has first, second and third ranges of thicknesses and wherein

the article receives the optimal amount of the cumulative irradiation at the first and third ranges of thicknesses and receives cumulative irradiations greater than the optimal amount at the second ranges of thicknesses and where the second range of thicknesses is between the first and third ranges of thicknesses and where

the member is positioned between the radiation source and the article in the second range of thicknesses of the article to reduce the cumulative radiation in the article to the optimal value.

32. A system as set forth in claim 31 wherein

the article receives individual amounts of cumulative irradiation at different thicknesses in the second range and where

the member has individual thicknesses for the different thicknesses in the second range to reduce the cumulative irradiation in the article to the optimal value for the different thicknesses of the article in the second range.

33. A system as set forth in claim 31 wherein

the member is disposed in the path of the radiation from the radiation source to the article in the second range of thicknesses of the article to reduce the cumulative irradiation in the article to the optimal amount and wherein

the member is disposed in the first and third ranges of thickness of the article to have no effect on the cumulative irradiation in the article.